What is claimed is:

1. A current density measuring apparatus for measuring current density in an electrode surface of a fuel cell, said fuel cell including an electrolyte electrode assembly and separators for sandwiching said electrolyte electrode assembly, said electrolyte electrode assembly including a pair of electrodes and an electrolyte interposed between said electrodes,

said current density measuring apparatus comprising:

a plurality of Hall elements provided at positions corresponding to measuring positions in said electrode surface; and

an output voltage measuring mechanism for measuring voltage values outputted from said Hall elements during power generation of said fuel cell,

wherein current density distribution in said electrode surface is determined based on said voltage values measured by said output voltage measuring mechanism.

2. A current density measuring apparatus according to claim 1, further comprising:

an electrically conductive sensor mounting plate having a plurality of poles provided at positions corresponding to said measuring positions in said electrode surface,

wherein a current sensor is attached to each of said poles.

3. A current density measuring apparatus according to claim 2, wherein said current sensor includes said Hall element and a substantially annular ferrite core having a slit; and

said ferrite core is externally fitted to said pole, and said Hall element is attached to said slit of said ferrite core.

4. A current density measuring apparatus according to claim 2, wherein said sensor mounting plate is provided on a cathode side of said fuel cell.

5. A current density measuring apparatus according to claim 1, wherein said output voltage measuring mechanism is connected to each of said Hall elements, and includes a current monitor for determining current density distribution in said electrode surface based on said voltage values outputted from said Hall elements.